What is claimed that:

1. A method for producing a polyrotaxane comprising:

an inclusion step in which carboxylated polyethylene glycol having a carboxyl group at each end and cyclodextrin molecules are mixed together, to obtain a pseudopolyrotaxane in which the carboxylated polyethylene glycol is included in the cavities of cyclodextrin molecules in a skewered manner; and

a capping step in which capping groups each having a group that reacts with a carboxyl group are reacted with the pseudopolyrotaxane, to obtain a polyrotaxane having at each end a capping group.

2. A method for producing a polyrotaxane comprising:

an inclusion step in which carboxylated polyethylene glycol having a carboxyl group at each end and cyclodextrin molecules are mixed, to obtain pseudopolyrotaxane in which the carboxylated polyethylene glycol is included in the cavities of cyclodextrin molecules in a skewered manner; and

a capping step in which the pseudopolyrotaxane is reacted with capping groups each having a $-NH_2$ group or a -OH group, to obtain a polyrotaxane having at each end -CO-NH-(capping group) or -CO-O-(capping group).

3. The method according to claim 1 or 2, wherein the carboxylated polyethylene glycol is prepared by the oxidation of polyethylene glycol with 2,2,6,6-tetramethyl-1-piperidinyl oxyradical (TEMPO).

4. A polyrotaxane comprising a carboxylated polyethylene

glycol included in the cavities of cyclodextrin molecules in a skewered manner, wherein the carboxylated polyethylene glycol has at each end a capping group to prevent the dissociation of the cyclodextrin molecules, the each end of the carboxylated polyethylene glycol has a structure obtained by the reaction between a carboxyl group and a capping group having a group that reacts with a carboxyl group.

5. The polyrotaxane comprising a carboxylated polyethylene glycol included in the cavities of cyclodextrin molecules in a skewered manner, wherein the carboxylated polyethylene glycol has at each end a capping group to prevent the dissociation of the cyclodextrin molecules, and the capping group at each end has a structure of a -CO-NH-Bl group or a -CO-O-Bl group.

6. A method for producing a pseudopolyrotaxane comprising:

a carboxylation step in which polyethylene glycol is oxidized with 2,2,6,6-tetramethyl-1-piperidinyl oxyradical (TEMPO), to obtain carboxylated polyethylene glycol having a carboxyl group at each end; and

an inclusion step in which the carboxylated polyethylene glycol and cyclodextrin molecules are mixed together, to obtain a pseudopolyrotaxane comprising the carboxylated polyethylene glycol included in the cavities of the cyclodextrin molecules in a skewered manner.

7. A pseudopolyrotaxane comprising a carboxylated polyethylene glycol included in the cavities of cyclodextrin molecules in a skewered manner, wherein the carboxylated polyethylene glycol has at each end a COOH group.

8. A method for producing carboxylated polyethylene glycol by oxidizing polyethylene glycol with 2,2,6,6-tetramethyl-1-piperidinyl oxyradical (TEMPO), to obtain the carboxylated polyethylene glycol having a carboxyl group at each end.